

Scope of Claim

1. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller characterized by that, with a device for supplying a specified quantity Q of gas G while dividing at a specified flow rate ratio Q_1/Q_2 from a gas supply facility 1 provided with a flow controller QCS into a chamber C through a plurality of branch supply lines GL_1 and GL_2 and shower plates 3 and 4 fixed to the ends thereof, open/close valves OV_1 and OV_2 are provided with an afore-mentioned plurality of branch supply lines GL_1 and GL_2 respectively, and also a bypass line BL_1 on the downstream side of an open/close valve OV_1 and branched from the branch supply line GL_1 , a bypass line BL_2 on the downstream side of an open/close valve OV_2 and branched from the branch supply line GL_2 , a pressure type division quantity controller FV connected to the afore-mentioned bypass lines BL_1 and BL_2 , a pressure sensor PS_1 to measure pressure inside the branch supply line GL_1 , and a pressure sensor PS_2 to measure pressure inside the branch supply line GL_2 are provided.

2. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 1 wherein a control device CT to regulate the degree of opening of a pressure type division quantity controller FV is provided to reduce the difference between actual pressure of the branch supply line and set pressure to reach the specified flow rate ratio Q_1/Q_2 by comparing either one of set pressure PI_1 or PI_2 of the branch supply lines GL_1 and GL_2 to reach the specified flow rate ratio Q_1/Q_2 with

corresponding actual pressure PT_1 or PT_2 of the branch supply lines GL_1 and GL_2 measured by the pressure sensor PS_1 or PS_2 .

3. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 1 or Claim 2 wherein an open/close valve OV_1 and an open/close valve OV_2 are pneumatically operated, and a switch valve SV is provided for supplying actuating air to the open/close valve OV_1 and the open/close valve OV_2 .

4. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 1, Claim 2 or Claim 3 wherein an open/close valve OV_1 and an open/close valve OV_2 are made to be integrated.

5. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 1, Claim 2, Claim 3 or Claim 4 wherein a pressure type flow controller FCS is used for a flow controller QCS .

6. A method for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller characterized by that, with a method for supplying a specified quantity Q of gas G while dividing at a specified

flow rate ratio Q_1/Q_2 from a gas supply facility 1 provided with a flow controller QCS into a chamber C through a plurality of branch supply lines GL₁ and GL₂ and shower plates 3 and 4 fixed to the ends thereof, open/close valves OV₁ and OV₂ are installed on an afore-mentioned plurality of branch supply lines GL₁ and GL₂ respectively, and also a bypass line BL₁ on the downstream side of an open/close valve OV₁ and branched from the branch supply line GL₁ and a bypass line BL₂ on the downstream side of an open/close valve OV₂ and branched from the branch supply line GL₂, a pressure type division quantity controller FV connected to the afore-mentioned bypass lines BL₁ and BL₂, a pressure sensor PS₁ to measure pressure inside the branch supply line GL₁ and a pressure sensor PS₂ to measure pressure inside the branch supply line GL₂ are provided so that a total quantity $Q=Q_1+Q_2$ of gas is supplied while dividing into a chamber C at desired division quantities Q₁ and Q₂ by opening the open/close valve of the branch supply line which has a larger flow rate to regulate the degree of opening of the afore-mentioned pressure type division quantity controller FV, and adjusting the flow rate of the branch supply line which has the larger flow rate to the branch supply line which has the smaller flow rate, thus regulating pressure in the branch supply lines GL₁ and GL₂.

7. A method for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 6 wherein it is so made that the degree of opening of a pressure type division quantity controller FV is regulated to reduce the difference between actual pressure of a branch supply line and set pressure to reach a specified flow rate ratio Q₁/Q₂ by

comparing either one of set pressure P_{l1} or P_{l2} of branch supply lines GL_1 and GL_2 to reach the specified flow rate ratio Q_1/Q_2 with corresponding actual pressure P_{T1} or P_{T2} of the branch supply lines GL_1 and GL_2 measured by the pressure sensor PS_1 or the pressure sensor PS_2 .

8. A device for supplying gas while dividing to a chamber from a gas supply facility equipped with a flow controller as claimed in Claim 6 or Claim 7 wherein it is so made that an open/close valve OV_1 and an open/close valve OV_2 are pneumatically operated, and a switch valve SV is provided for supplying actuating air to the open/close valve OV_1 and the open/close valve OV_2 so that the open/close valve of the branch supply line with the larger supply quantity is made open by the switch valve SV .

9. A method for supplying gas while dividing to a chamber from a gas supply facility equipped a flow controller as claimed in Claim 6, Claim 7 or Claim 8 wherein it is so made that a pressure type flow controller is used for a flow controller QCS .

Summary

The present invention is for supplying a specified quantity Q of processing gas while dividing at a desired flow rate ratio Q_1/Q_2 accurately and quickly from a gas supply facility equipped with a flow controller into a chamber. With the present invention, a total quantity $Q=Q_1+Q_2$ of gas while dividing is supplied into a chamber C at a desired flow rate Q_1 and Q_2 through shower plates 3 and 4 fixed to the ends of branch supply lines GL_1 and GL_2 by providing open/close valves OV_1 and OV_2 with a plurality of branch supply lines GL_1 and GL_2 respectively to supply a specified quantity Q of gas G from a gas supply facility 1 equipped with a flow controller QCS into a chamber, and by utilizing a bypass line BL_1 on the downstream side of the afore-mentioned open/close valve OV_1 and branched from GL_1 , a bypass line BL_2 on the downstream side of the open/close valve OV_2 and branched from GL_2 , a pressure type division quantity controller FV connected to the bypass line BL_1 and the bypass line BL_2 , a pressure sensor PS_1 to measure pressure inside the branch supply line GL_1 , and a pressure sensor PS_2 to measure pressure inside the branch supply line GL_2 .